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Cotton Pushes "Natural" Edge for More Fibers in the Fabric

Hard Times for Farm Machinery
page 7

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PERSPECTIVES

THE FARM INCOME OUTLOOK looks much better than it did at the beginning of the year, but that's still not much to boast about. Even the positive indicators suggest that any significant upturn in farm income will have to wait at least until 1984.

This year's most promising news is on the expense side, not the receipts side, says USDA economist Gary Lucier. Total cash receipts are expected to drop from 1982's level, reflecting smaller crop sales and slightly smaller to somewhat larger sales from livestock marketings. For the first time since 1979, cash receipts from livestock are likely to exceed receipts from crops. For crop producers, however, the bonus is on the expense side. The sharp cutback in plantings means farmers will spend less on fertilizer, pesticides, fuel, seed, operating credit, machinery repair, and other production inputs. The result: Farm production expenses may drop 2 to 4 percent, the first decline since 1953.

Direct government payments to producers will rise. With $4-$5 billion in cash payments and $5-$7 billion worth of PIK commodities, government transfers could top $10 billion, Lucier says. Another $1-$3 billion in 1983 PIK program commodities could be disbursed in 1984 as farmers take advantage of the full 5 months of storage assistance. Government payments totaled about $3.5 billion in 1982. Under the PIK program, farmers will receive around 1.8 billion bushels of corn, 549 million bushels of wheat, and 114 million cwt of sorghum. Figures on cotton and rice in-kind payments will be available later.

Among other income-boosting developments, Lucier lists declining interest rates, lower inflation rates, increased crop prices, and drawdowns in commodity inventories. These factors, he says, should help improve the farm sector's financial position in the long run as well as in the current year. However, he also stresses key uncertainties in the farm income picture, including the timing of PIK marketings, the extent of acreage cutbacks, the content of 1984 farm programs, and the strength of the economic recovery that seems to be getting underway.

Net farm income before inventory adjustment, often called realized net farm income, is projected at $20-$24 billion, up from 1982's estimated $20.2 billion. The difference between this forecast and the one in the following paragraph illustrates the impact of figuring in year-to-year changes in the value of farmers' inventories.

Total net farm income after inventory adjustment, the most commonly cited measure of farm income, is forecast to range from $18-$22 billion this year. That leaves room on both sides of 1982's figure, currently estimated at $20.4 billion. But note: The 1983 forecast reflects a $1-$4 billion reduction in the net value of farmers' inventories. Inventories represent a storehouse of potential income, so figures for "total net farm income" include net additions or reductions in the value of inventories from year to year. This year's sharp reduction in crop inventories is expected to offset a gain in livestock inventories. Contrast that with 1982, when net additions to stocks raised total net farm income about $200 million.

Net cash income measures the cash available for investing in capital assets, paying on debt principal, and maintaining the farm household. The forecast: $32-$36 billion, up from the $32.2 billion estimated for 1982.

Off-farm income from jobs, investments, and other nonfarm sources is forecast at $41-$45 billion, up from $41 billion in 1982.

Overall farm debt is expected to level off, totaling somewhere between $217 billion and $221 billion on January 1, 1984. The low end of the range represents a slight decline from the debt level at the start of this year, while the high end represents a 2-percent increase. Compare that with the average growth rate in farm debt of 12 percent a year since 1970. Smaller production expenses are expected to reduce short-term borrowing, while increased government payments will improve cash flow and may help pay off some current debt. Interest payments by farmers are projected to drop 2 to 3 percent from last year's $23 billion.

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FEATURES

Cotton Pushes "Natural" Edge for More Fibers in the Fabric *by Ellen Banker* 4

Another battle between the fibers looms this year, but the issue isn't all natural versus all synthetic. Today's key question is: Which will have more fibers in the fabric? Cotton's backers are putting their money on a campaign that promotes fabrics of at least 60% cotton. They're stressing cotton's "natural" advantage, though cotton still faces very stiff competition from manmade "miracle" fibers.

Farm Machinery Dealers Show Signs of Hard Times *by Daniel Williamson* 7

The recession in farm machinery sales has crippled many dealerships and even threatened the survival of large manufacturers. While layoffs, salary cuts, and cost-conscious management are keeping most businesses afloat, the statistics show swelling inventories, rising expenses, a steady erosion of profits, and a growing dependence on parts sales and service revenue. The industry may emerge leaner and stronger than ever, but the signs still aren't too encouraging.

Is Higher Priced Water the Key to Conservation? *by Leland Scott* 12

Will the western states soon run out of irrigation water? Not if water is used and priced wisely, say Wilson and Ayer. They point out that the amount of water used per acre is closely tied to the price of water. Farmers paying higher prices invest in more efficient irrigation systems. If water conservation is an important goal, then federal agencies that supply low-priced water should take a close look at their pricing structure, according to the two economists.

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Cotton Pushes "Natural" Edge for More Fibers in the Fabric

Another battle between the fibers looms this year, but the issue isn't all natural versus all synthetic. Today's key question is: Which will have more fibers in the fabric?

Cotton promoters hope it will be cotton. The industry's durable, permanent press 60-percent cotton to 40-percent polyester fabric will be used much more this year, especially in clothing. But it will be up against some stiff competition from manmade fibers.

Manmade fiber manufacturers also have a 60/40 weight fabric, with polyester as the predominant fiber, plus a whole arsenal of other polyester fabrics already widely used in clothing.

Polyester, the manmade "miracle" fiber first introduced in 1953, virtually took control of the U.S. clothing industry in the 1960's and early 1970's, trimming cotton's share down from 69 percent in 1960 to 44 percent in 1970 and 35 percent in 1980. Polyester's most attractive quality: You can wash it and wear it without ironing. Cotton clothing wrinkles unless it's treated with special chemicals that add to its cost.

Polyester is now the largest selling fiber in the country and can be found in everything from ladies' lingerie to artificial arteries. More than 4.2 billion pounds were produced in the United States last year, up from 2.3 billion in 1973, and only 100 million pounds back in 1960.

Largely because of the growing popularity of polyester here and abroad, cotton's share of world fiber production declined from 76 percent in 1960. It's holding steady today at just over 50 percent.

Despite polyester's past inroads, neither fiber has fared particularly well in the last few years. "Demand for cotton has really been stagnant because of the sluggish world economy," says economist Keith Collins of USDA's Economic Research Service. "But the same is true for polyester. Its share of the fiber market has stabilized in the last 5 years and

even declined during 1982. The domestic textile industry has really felt the pinch."

The figures bear him out:

- Per capita cotton consumption (mill use plus net cotton textile trade) was 13.5 pounds in 1982, down 6 percent from 1981. Domestic mill use of cotton was at its lowest point in 50 years.
- Domestic polyester production was down about 24 percent in 1982.
- Total U.S. mill use of fibers was down 13 percent from just a year earlier.

What's ahead for fibers? "Things should improve this year," Collins says. "When the economy rebounds, a lot of pent-up demand could be unleashed."

The domestic textile industry showed signs of improvement in the last half of 1982. Production increased and unemployment dropped. And, in early 1983, the textile industry's fiber demand grew sharply. Collins adds that a return to prerecession textile levels would mean further increases in fiber consumption of up to 20 percent.

Even the slightest swing in blend levels involves huge amounts of fiber poundage.

When the time comes, cotton expects to be ready. Dave Cox, Vice President of Cotton, Inc., the commodity's research and promotional company, sees economic recovery as cotton's chance to regain some territory lost to polyester.

Cotton's Crisis

For cotton, the bottom came in 1975. Its share of the retail fiber market hit a low of 35 percent that year. For wearing apparel, the figure was 33 percent. Since then, cotton has been struggling to regain a larger part of the clothing market.

According to Cox, women's apparel is usually the best indicator of what's ahead for clothing. It reacts sooner (cotton's share of the women's clothing market hit its low in 1974) and more strongly than the men's or children's categories. By the same token, cotton has made its strongest recovery in women's clothing, climbing 63 percent in market shares between 1975 and 1982.

"But today, the real interest is in men's slacks," Cox says, "mainly because cotton's 60/40 fabric is taking a big bite out of the 100-percent polyester market." Cotton's share of the market for men's slacks was only 10 percent in 1975 but shot up to 24 percent last year.

Cox views these increases as indicative of the future, especially if men's dress shirts are also considered—cotton's share almost doubled in just 7 years with 60/40 and other mostly cotton blends.

Cotton, Inc., is putting U.S. cotton growers' money behind 60/40 in the form of extensive advertising. It's their Natural Blend campaign—tags and ads of the industry's recognizable Cotton Seal with the words Natural Blend below it.

The Natural Blend campaign promotes fabrics of at least 60-percent cotton, but—as Cox points out—the more cotton, the better for producers. Even the slightest swing in blend levels involves huge amounts of fiber poundage. Many polyester manufacturers, however, are not giving up their markets so easily.

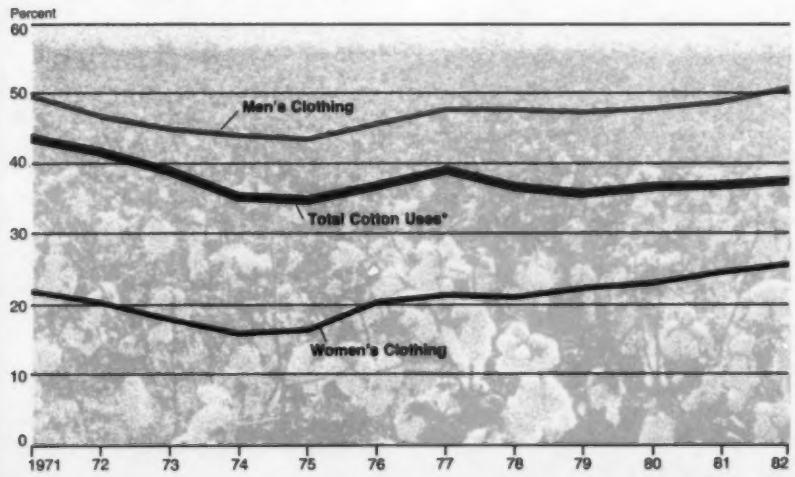
Memories of Double-Knit

An unraveled reputation is hard to mend. For some people, polyester brings back images of gaudy, poorly made double-knit leisure suits popular in the early 1970's.

Polyester's growth rate slowed after 1973, partly because of the double-knit disaster, and partly because the number of products left for polyester to conquer was getting limited, and cotton became more price competitive when petroleum prices increased.

The production of synthetic fibers depends heavily on petroleum, so as oil

Cotton's Share of Retail Fiber Markets Hit Its All-Time Low In 1975 But Has Steadily Increased In Recent Years



*Includes clothing, home furnishings (sheets, draperies, towels, upholstery, etc.), and piece goods; excludes carpets.

prices increased during the 1970's, polyester prices also rose steadily, reversing a long downward trend. In 1973, when price increases first began to affect polyester, polyester staple sold for 37 cents a pound and cotton (at mills) for 58 cents. During 1982, polyester sold for 77 cents a pound and cotton for 76 cents.

"The effect of oil prices was more of an issue in the 1970's than it is today," Collins says, "because oil prices have stabilized and cotton and polyester both suffer from excess production capacity." Several studies predicted both prices would be equal by 1985. For manufacturing purposes, that has already happened.

Since American consumers seem to be leaning toward "natural" products, a resurgence in cotton clothing seems likely. However, the synthetic fiber industry is also developing fibers with "natural" characteristics for the 1980's.

Du Pont, Inc., the world's largest manufacturer of polyester, wants people to forget the days of double-knit and extensively promotes its own brand—Dacron. Many polyester manufacturers similarly play up brand names and relegate the generic terms "polyester" to fine print. Others prefer candor. Eastman Kodak Company's ad: "Kodel put the yes in polyester."

Polyester's best attribute may be practicality, but easy care has also come to cotton, with durable-press blends. And researchers are looking for ways to perfect the same process (an ammonia treatment) for 100-percent cotton fabrics. There's one market, however, that's perfect for cotton just the way it is—denim.

An Unfaded Fad

If any fabric can be called all-American, it's denim, though it was actually invented during the Middle Ages in Western Europe. Denim has become a worldwide favorite today in the form of blue jeans.

According to Collins, denim is cotton's single largest consumer product, taking about 1 million bales per year. And it's also one of cotton's few remaining strongholds.

According to figures from Cotton, Inc., 83 percent of the blue jeans sold in the United States are all cotton, 14 percent are a cotton/poly blend and the small remainder are all polyester.

Synthetics manufacturers did make attempts to find a place in the denim market in the early 1970's, pushing cotton's share down to 77 percent in 1974. But the synthetic success didn't last. Cotton is the preferred fabric for denim because, after it's washed, cotton becomes soft, supple, and comfortable—qualities synthetics can't easily match.

Another factor is fashion. The faded look in blue jeans is chic, and cotton denim fades faster when washed than jeans made with synthetics. □

[Based largely on material provided by economist Keith Collins of the National Economics Division, Economic Research Service.]

Home-Grown Imports?

How much raw cotton moves out of the United States and then returns to us as shirts, dresses, and other textiles?

Although the United States produces only a fifth of the world's cotton, it exports more than half of its harvest. Over 80 percent of the exports go to countries in the Far East.

At the same time, U.S. imports of foreign textiles have increased by record amounts. In 1982, they totaled the equivalent of 1.9 million bales, up from about 1 million in 1974. More than 80 percent of the imports came from Asian nations, particularly Korea, Hong Kong, and Taiwan and Mainland China.

The connection between raw cotton exports to Asia and growing textile imports from Asia seemed apparent, although supporting data were lacking. Until recently, USDA estimates showed only world totals—the raw cotton equivalent of U.S. imports from all countries combined. Now, cotton textile import data are available by country of origin.

The first studies of the new data, by economists Ed Glade and John Lawler of USDA's Economic Research Service, show some surprising results. It's true that more than 26 percent of all U.S. cotton textile imports came from Hong Kong in 1982—the equivalent of 490,000 bales. Taiwan, Korea, and China also accounted for a major share of total U.S. textile imports. In most cases, these countries purchase large quantities of U.S. raw cotton.

However, a significant share of our cotton textiles were imported from countries that purchase very little or no U.S. cotton, such as India, Pakistan, and Egypt. Last year, 35 to 40 percent of all U.S. cotton textile imports came from nations that accounted for only about 8 to 10 percent of total U.S. exports of raw cotton.

As the country-of-origin import series is developed and monitored, further analysis of the U.S. raw cotton content of imported cotton products will be possible. This will provide useful information for investigating various trade policy implications, such as market development efforts and alternative export promotion programs.

Farm Machinery Dealers Show Signs of Hard Times

With U.S. farm machinery sales devastated by high interest rates and depressed farm income, manufacturers and retailers are struggling to emerge from a recession that has crippled many dealerships and even threatened the survival of giant manufacturers.

During 1982, unit sales of farm equipment fell precipitously from already depressed year-earlier levels: tractor sales fell 26 percent; combines, 40 percent; balers, 35 percent; and forage harvesters, 32 percent. Overall, the industry is now operating at about 50 percent of capacity.

Many manufacturers, suppliers, and dealers have taken drastic measures to survive, including freezing salaries, canceling employee benefits, slashing capital spending, and encouraging early retirements, according to ERS economist Paul Andrilenas.

These tactics appear to be paying off for most dealers: the Farm Equipment Manufacturers Association reports that only 880 of approximately 10,000 dealerships have gone out of business since January 1, 1981, despite the lean times. In the last half of 1982, an association survey found that only 42 dealers closed their doors because of bankruptcy.

Manufacturers also appear to be weathering the economic storm, Andrilenas notes. Industry analysts predict that nearly all major manufacturers will survive—although some major firms may have to reorganize, perhaps in bankruptcy courts. Many firms may become smaller, more specialized companies that produce fewer products more efficiently.

Given this restructuring, the U.S. farm machinery industry isn't expected to return to its old form or its former robust strength. And as the U.S. industry is becoming less centralized, it is bracing itself for an onslaught of stronger competition from foreign firms.

The financial footing of many U.S. firms has been severely weakened, making them vulnerable. Further, the loyalty and confidence of dealers and customers of many U.S. firms have been badly shaken.

Local Dealerships Struggle

While the more earthshaking economic plunge of giant manufacturers has been widely reported, the teeth-rattling reverberations on dealers have received relatively little attention. For farmers, the fate of local dealerships which supply

and service essential equipment is probably as important as the survival of major manufacturers.

Dealers have struggled to maintain their share of sales in the depressed market. This difficulty was compounded if they handled products from a firm that appeared on the verge of bankruptcy. Customers worry about warranty and service on equipment should the manufacturer go out of business.

Even dealers selling equipment from stronger firms have suffered from depressed sales and high interest rates. To reduce inventories and maintain sales, many dealers have slashed prices, adding pressure on marginal dealerships. Further, used equipment prices—particularly items manufactured by financially troubled firms—have declined.

How bad has business been lately? According to 1981 data from an industry study, average sales per dealership increased 6 percent from over $2.3 million in 1979 to just under $2.5 million in 1981.

When inflation is taken into account and sales are expressed in constant 1972 dollars, the average sales value for 1981 slips from $2.5 million to $1.5 million. Thus, 40 percent of the dealers' volume of business is due to inflation. The slippage continued through last August as per-unit sales of new equipment fell at least a fourth from year-earlier levels.

Meanwhile, expenses soared, chewing away dealers' profits. Average dealership expenses rose $44,835—13.4 percent—from $335,566 in 1980 to $380,401 in 1981. Overall, expenses as a percentage of gross sales rose from 13.2 percent in 1979 to 15.3 percent in 1981.

High interest charges are a major factor in rising expenses, since dealers usually borrow funds to maintain their inven-

Many manufacturers, suppliers, and dealers have taken drastic measures to survive.

tories of equipment for sale. Interest charges in 1979 were about 0.76 percent of sales, representing about $18,000 in average annual costs for dealers. In 1981, these average dealer charges more than doubled to 1.53 percent of total sales, with an average cost of $37,996.

Swelling Inventories

Interest rates, then, created a spiraling problem for dealers. As interest rates rose, they pushed up the expense of maintaining inventories while depressing sales and slowing the inventory turnover. As the inventory increased due partly to interest rate-depressed sales, debt-financing costs were jacked up several more notches.

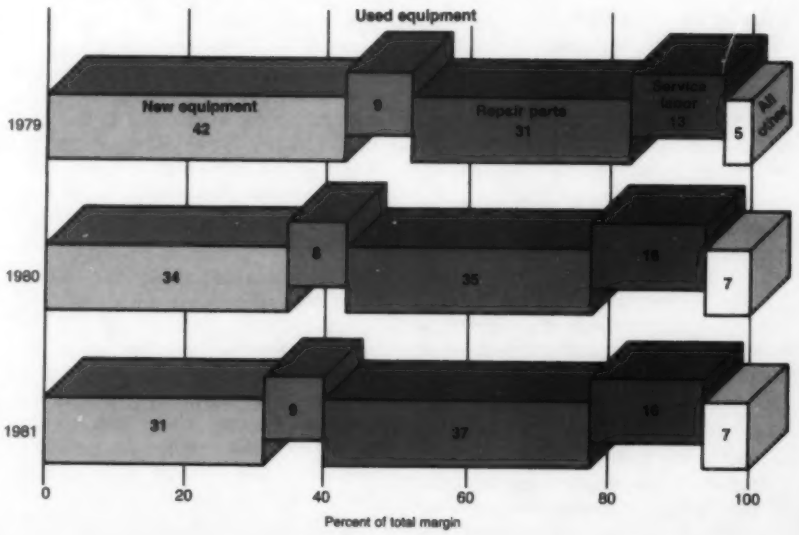
Hard figures underline this predicament. Average dealer's inventories of new and used equipment grew about 42 percent, from $628,498 in 1979 to $890,304 in 1981, Andrilenas notes. Pushing up the inventories was a decline in equipment turnover as the annual number of times total inventory was bought and sold declined from 2.36 in 1979 to 1.62.

A related cost in maintaining dealer inventories was average occupancy expenses—the cost of land and facilities—which jumped from 1.24 percent of sales in 1979 to 1.42 percent in 1981.

Other rising expenses also pressed dealers. Salaries comprised 35 percent of total dealership expenses in 1981, the largest cost element. The figure would be even higher, but salaries of mechanics and servicemen are charged to their sales accounts.

Dealers' efforts to restrain rising costs are evident in developments concerning salary expenses. Although salaries as a

New Equipment Sales Account for Smaller Share of Dealers' Margins, While Repair Parts and Service Business Increases



percent of total sales increased from 5.1 to 5.4 percent from 1979 to 1981, average dealership personnel dropped 7 percent from 14.1 to 13.1 persons, reflecting the sluggish market. From 1970 to 1981, sales per employee more than tripled from about $58,000 to over $188,000.

The net effect of all of these rising expenses and sluggish sales has been an erosion of profits. In the early 1970's, average net operating profit was $24,250, rising to $86,190 in 1979, but declining to $55,596 in 1981. Net profit on sales alone dropped from about $30,000 in 1979 to a net loss of almost $7,000 in 1981.

The net effect of rising expenses and sluggish sales: An erosion of profits for dealers.

Weighing heavily on farm machinery sales and profits is the anemic farm income performance of the past few years. When farmers are in a financial bind, they defer expensive equipment purchases as much as possible, making do with equipment on hand. Cheaper used equipment and parts and service sales, which provide less profit, become a larger portion of a dealer's total business.

The slump in equipment sales has created a buyers' market which forced down the average profit margin on new and used equipment from 9.9 percent in 1979 to 8.6 percent in 1981—about a 13-percent drop. From 1980 to 1981, the profit margin for parts was almost flat at about 31 percent, but the profit margin on service labor increased over 1 percent to almost 38 percent.

Assets Versus Liabilities

While profit margins tightened, the dealers' assets, as stacked against liabilities, declined in 1981. Faced with growing inventories and slow sales turnover, dealers have seen average ownership equity—assets minus liabilities—decline from 29.3 in 1979 to 24.6 percent in 1981.

Measured another way, the ratio of current assets to current liabilities fell from 1.4 to 1 in 1979 to 1.3 to 1 in 1981. A 2-to-1 ratio is traditionally considered by commercial lenders to be a safe asset-to-debt standard.

Given the financial turmoil of recent years, the asset-to-debt ratio isn't the only traditional standard to fall by the wayside. In more normal years, such as 1979 and 1980, the percentage profit earned by the average dealer increased in proportion to the size of the dealership and the sales volume handled: The bigger the dealership, the greater the profit rate.

However, in 1981, this progression with size didn't hold as dealers in the $2–$3 million sales categories dropped their margins more than those in other categories.

Dealers with $1–$2 million in sales volume had a profit of 1.86 percent of sales, compared with 1.45 percent among dealers in the $2–$3 million category. Those doing less than $1 million in sales reported a 0.02-percent profit, and those topping $3 million in sales reported an average profit of 2.89 percent.

The ownership equity picture closely mirrors that of profits. The largest and smallest dealership categories had higher percentages of ownership equity—24.89 and 25.75 percent, respectively. Dealers in the $1-2 million and $2-3 million categories had 24.23 and 23.87 percent ownership equity, respectively.

However, while recognizing that some dealers and classes of dealerships are less scathed than others in today's rocky farm machinery market, just about all dealers appear to be taking at least some lumps.

Even so, as the recession appears to be ending, some analysts suggest that many dealerships may emerge stronger than ever. The survival techniques have pared away waste, sharpened management, and made dealers more aggressive in providing service and catering to the needs of customers in their area. □

[*Based on material provided by economists Carl J. Vosloh (now retired) and Paul Andrilenas of ERS' National Economic Division.*]

Mr. Average

If a dealership's size relates to its ability to ride out current economic conditions, a look at the statistically "average dealership" might provide a useful point of reference.

However, keep in mind that creating a dealership from statistical averages is much like creating Frankenstein's monster: the assorted parts might form a recognizable creature, but no real dealership can be—or would especially want to be—its mirror image.

In 1981, the average dealership sold almost $2.5 million in equipment, more than four times the sales in 1972. To make these sales, an average inventory worth $890,304 was maintained. The staff of 13 employees sold an average of $188,966 each, or over twice the 1972 sales per employee average.

On the service side of the operation, the average dealership had at least two parts salespeople, and parts sales were $210,289. Around six service people generated average revenue of about $27,748 each—up from an average of $9,319 in 1973.

While the increases in dollar amounts from 1972 are huge, they shrink considerably when inflation is taken into account: a dollar in 1972 was worth only 60 cents in 1981.

Bagged, Bottled, or Canned, Rice Is In

Rice is the primary food of over half the world's population. While this has never been true in the United States, per capita consumption figures show the American appetite for rice is definitely on the rise.

At 8 pounds per person in the 1980/81 marketing year, rice consumption has increased dramatically from the 5-pound level of the mid-1950's, says agricultural economist Shelby Holder of the Economic Research Service.

How do Americans take their rice? More often than not, they use it in its most direct and recognizable form—as rice—the same way the rest of the world's consumers do. According to Holder, direct food use, as opposed to indirect consumption through processed foods and beverages, accounted for about 60 percent of all milled rice distributed in domestic markets during 1980/81. Direct use also set a record at 19 million cwt, up from 8 million in 1955/56.

"Researchers keep careful track of rice's domestic outlets through periodic surveys, which started in 1955/56," says Holder. "The latest survey, like all the others, shows that direct food use, beer, and processed foods—in that order—are the three major markets for domestic rice."

Rice used directly as food includes regular milled white rice (long, medium, and short varieties) and specialty rices (parboiled, precooked, and brown). Regular milled white rice makes up over 80 percent of food rice, but some of the specialty rices are also contributing to growing demand.

In fact, consumption of specialty rices increased about 15 percent between 1978/79 and 1980/81, with parboiled rice accounting for almost half the growth.

Among specialty rices, parboiled rice is most popular with 58 percent of the market in 1980/81, followed by precooked rice with 30 percent. Precooked or quick-cooking rice passed the 1 million cwt mark for the first time in 1980/81.

Beer, the second most important domestic outlet for rice, accounts for 25 to 30 percent of all domestically distributed rice. For the brewing process, the beer industry uses mostly broken rice kernels, which are sold at much lower prices than whole kernels. In general, brewers only purchase whole kernel rice when adequate supplies of "brokens" are not available.

Processed food use, the third category, includes breakfast cereals, package mixes, soups, baby food, and various other uses in such products as pet food, rice flour, and candy. Altogether, these products accounted for about 15 percent of the domestic milled rice in 1980/81. Processed food use has almost tripled since the mid-1950's, increasing from 1.5 million cwt in 1955/56 to nearly 4.5 million in 1980/81.

Breakfast cereals are the single largest outlet, accounting for 58 percent of the rice used in processed foods. Medium grain rice is preferred by cereal manufacturers, while long grain is more popular with manufacturers of package mixes (rice packaged with seasonings, flavorings, or other mixings). Packaged mixes accounted for about 30 percent of total processed food use in 1980/81, and soup, baby food, and other products for the rest.

The use of rice in soup and baby food declined from 1978/79 to 1980/81. Price is probably the primary reason, according to Holder. "Soup and baby food processors are sensitive to rice prices since they can easily adjust the ingredient proportion as prices rise or fall," he says. The price of "second heads," the class of brokens usually used in baby food, increased from an average of $8.35 per cwt in 1978/79 to $12.65 in 1980/81.

Another Look at Urban Sprawl

Although urban America sprawls over more and more rural land each year, how much acreage is now occupied by city folk?

The 1980 Census counted 226.5 million people on 2,265 million acres of U.S. land. Divided equally, this comes out to 10 acres per person.

In reality, of course, about 74 percent of the population lives on only 2 percent of the land. That works out to an average quarter-acre each, including land used for housing, roads, recreation, shopping, and other facilities. Meanwhile, rural residents have about 37 acres per person.

Urbanization is growing. In 1960, it covered 25.5 million acres. The total grew to 34.6 million in 1970, and expanded to 47 million in 1980. Over the last decade, about 1.3 million acres a year became urbanized. According to Tom Frey, a geographer with USDA's Economic Research Service, some of this rapid increase can be a matter of definition.

"The census includes in its definition of urban areas large cities, suburbs, and towns as small as 2,500 people. Frequently, vacant areas around small towns—such as open fields, forests, and cropland—are legally incorporated into town boundaries and are counted as urban areas. The inclusion of these areas somewhat overstates the amount of urban land. Nevertheless, urban land is increasing, and the census data are useful for tracking the increase," Frey says.

While the amount of urban land is growing, so is the amount of land per urban dweller. Per capita urban land grew from 0.20 acre in 1960 to 0.23 acre in 1970 and 0.28 in 1980.

According to Frey, much of this growth is due to a more affluent population leaving the cities and moving to the suburbs. As the population moves, more land becomes available in cities. In addition, the affluent take more land per person as they move into the suburbs.

Once again, Frey also attributes some of the increase in land per capita to the inclusion of vacant land in urban land estimates.

Foreign Investors Buy American

Foreign investors were full or part owners of about 13.5 million acres of U.S. agricultural land at the close of 1982, according to USDA's latest count.

That's up a million acres from December 31, 1981, and more than 5½ million acres above the reported total at the end of 1980. However, nearly half of each year's increase actually reflects updated or corrected numbers for past years rather than new land acquisitions by foreign investors.

Since early 1979, foreign owners have been required by law to report their holdings, acquisitions, and dispositions of agricultural land to USDA. After the figures are tabulated each year, the results are analyzed by the Economic Research Service in a special report to Congress.

The latest report, by attorney Peter DeBraal and economist Alex Majchrowicz, says the foreign acreage tally now amounts to slightly more than 1 percent of all privately owned U.S. agricultural land. Stated another way, Americans own about 99 of every 100 acres, and even this figure may exaggerate the extent of foreign ownership. Here's why:

- U.S. corporations that are owned or partly owned by foreign interests hold more than 60 percent of the acreage reported by foreign investors. If foreign investors hold at least 5 percent of the shares in a corporation, the land is classified as foreign owned.
- The foreign-owned total also includes land owned jointly by U.S. and foreign partners. About 1.4 million acres fit into this category.
- The agricultural acreage held by foreign investors is not limited to land used for crops or livestock. More than half the acreage is forestland. Only 13 percent is classified as cropland, and 27 percent as pasture or other agricultural land.

Three-fourths of the foreign-held acreage can be traced to investments coming from Canada, Britain, Hong Kong, West Germany, and the Netherlands Antilles (Dutch West Indies). Altogether, more than 80 nations are represented on the foreign ownership rolls, although the country of registration is not necessarily an accurate indicator of the nationality of the investor.

By state, the largest number of foreign-owned acres—2.7 million—is in Maine. These holdings account for 14 percent of all privately owned agricultural land in the state and 20 percent of all foreign-owned agricultural land in the nation. Almost all the Maine acreage is owned by three large timber companies—two are U.S. companies which are partly foreign owned, and one is a Canadian company with only partial ownership shares in the U.S. land.

Outside of Maine, foreign holdings are concentrated in the South, with 34 percent of the total, and the West, with 31 percent. After Maine, the largest total holdings are in Georgia, 944,000 acres; Texas, 913,000; California, 899,000; New Mexico, 662,000; Alabama, 590,000; Oregon, 527,000; and South Carolina, 507,000. Rhode Island is the only state with no reported foreign-owned agricultural land.

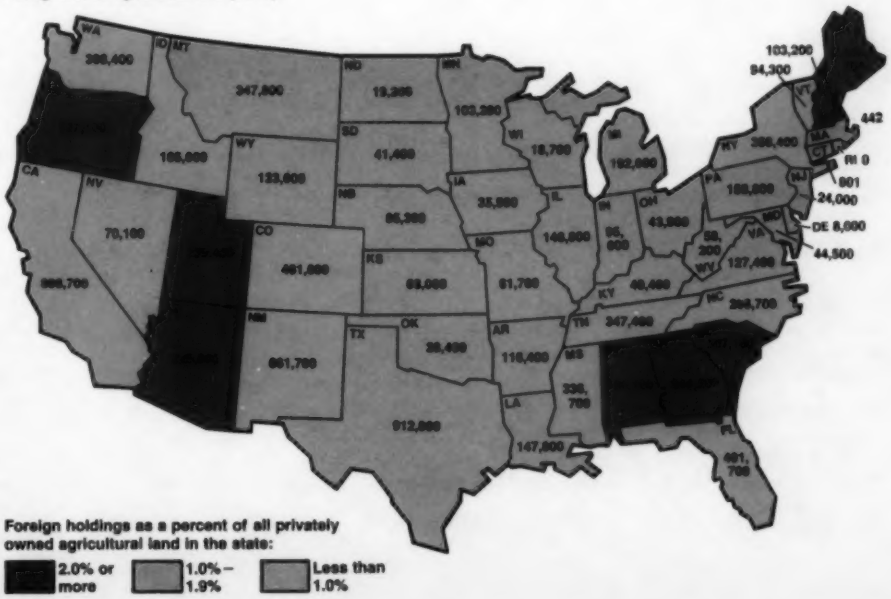
Foreign investors do not appear to be taking purchased agricultural land out of production. No change in intended use was reported for 92 percent of the acreage. About half of the foreign owners reported paying cash only for their landholdings.

No one can predict whether foreign investors will continue to add to their acreage this year. A single large transaction or shift in corporate ownership could bump the total in either direction.

Also, future changes in the total will be made to reflect a more accurate accounting for 1982 and prior years. Since foreign owners have 90 days to file, land transactions from October to December 1982 may not have been reported in time to be included in the current figure. In addition, each year brings late and corrected filings from foreign owners requiring further adjustments (generally upward) in the figures. Between October 1981 and December 1982, USDA assessed more than a half-million dollars in penalties for late filings by foreign investors.

Rhode Island Is the Only State Where No Foreign Holdings Were Reported

Foreign-owned agricultural land (acres):



Is Higher Priced Water the Key to Conservation?

Are the western states running out of irrigation water? Although this question has caused some apprehension, USDA analysts see sufficient supplies for the foreseeable future in most but not all locations.

Since water supplies are constantly replenished—though at a lesser rate than use in many areas—there can be enough for farming for years to come if we use and price it wisely, according to USDA economists David Wilson and Harry Ayer of the Economic Research Service.

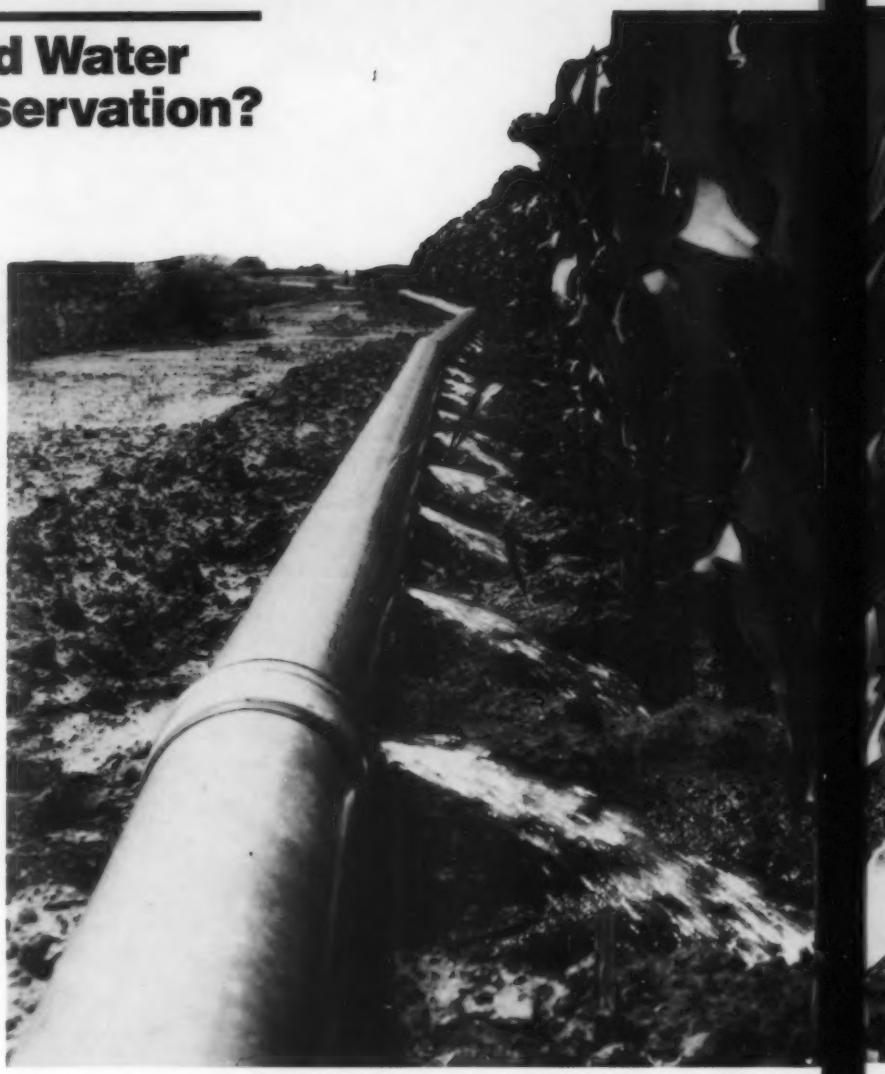
The government, which controls much western irrigation water, determines prices for water in many areas. If supplies are diminishing too rapidly, the economists suggest, price increases can encourage more efficient irrigation methods. In other words, where water is costly, users employ it efficiently, but where it's inexpensive, they're not so careful.

Ayer and Wilson define inexpensive water as that which has application costs too low to justify implementing conservation practices and technologies. They indicate that, in 1978, $15 per acre-foot (1 foot of water applied to 1 acre of farmland) was often a threshold of expensive water for farmers.

Of course, western water costs vary widely on either side of that $15 mark, depending on the source (surface or ground water, public or private), the delivery system, the feet of lift for ground water, and the cost of energy.

In 1978, average irrigation water costs ranged from $2.21 per acre-foot on a small area in Utah to $26.75 on a selected area in Oregon. Even within a given state, similar extremes exist.

However, the cost of roughly half of all water applied to farmland in the West was less than $20 per acre-foot in 1978. Some 25 percent cost $15 or less, and more than 90 percent of this was surface water. Water supplied by the U.S. Bureau of Reclamation (USBR), all of which is surface water, also falls primarily in this lowest cost category.



Gated pipes are generally more efficient than flood or syphon tube irrigation systems, especially if runoff water can be recovered and reused.

The average pumping lifts—depths from which water must be pumped—tend to be greater for higher cost water. For most water costing $20 per acre-foot or more, pump lifts were over 230 feet. Pump lifts for most water costing less than $15 were less than 60 feet.

While the cost of pumping ground water is greatly affected by the type of pumping system and energy used, these figures indicate that pumping lift is a key factor. Surface water, of course, usually has a minimal pumping lift—often less than 50 feet in the West.

Water Use Tied To Costs

Significantly, the authors found, the amount of water used per acre is closely related to the cost. Application averaged 3 feet per acre when the cost of water was $15 per acre-foot or less, whereas the average rate was 1.4 feet per acre in areas where the cost of water was $25 per acre-foot or more.

The correlation also holds for surface and ground water. Since the cost of surface water is much less, areas supplied with surface water applied considerably more than those using ground water.

Of course, climate, topography, soil type, and the crop grown also influence application rates. However, even in desert areas and on water-hungry crops, application rates can be lowered substantially through the use of more efficient application systems—sprinklers and gated pipes instead of flooding and siphon tubes.

Ayer and Wilson estimate that flood and siphon tube systems are only 45 to 65 percent efficient, while crops irrigated with sprinklers and gated pipes (plus a system trapping and reusing runoff water) use 60 to 90 percent of the water applied. But switching to a more efficient irrigation system costs money, and

Where water is costly, users employ it efficiently, but where it's inexpensive, they're not so careful.

unless the money saved in water costs is high enough, few farmers can afford to conserve.

Reflecting this, the authors found that farmers with access to very inexpensive water ($15 and below) generally flood their fields in irrigating, but farmers using high-cost water employ sprinklers and gated pipe systems almost exclusively.

Thus, while many factors combine to determine the amount of water and type of irrigation system used, the cost of water emerges as a telling one. As with energy, higher prices would automatically lead to more efficient use, as investments in conservation technologies—including laser-leveling of fields and irrigation scheduling—would then become profitable.

As Water Costs Rise, Farmers Tend To Tighten the Spigot on Irrigation Use

Price per acre-foot	Water applied per acre
	acre-feet
$5.00 and under	5.07
$5.01–$10.00	3.45
$10.01–$15.00	2.51
$15.01–$20.00	1.27
$20.01–$25.00	2.13
$25.01–$30.00	1.30
$30.01–$35.00	1.60
$35.01–$40.00	0.71
$40.00 and up	0.92

Factors other than water costs influence application rates, including type of crop, climate, soil conditions, topography, and location of production.

"If water conservation is a federal objective," the authors conclude, "then a restructuring of contractual water prices administered by federal agencies should be considered." Such a change was, in fact, proposed by the National Water Commission in 1973, and by the Congressional Budget Office in 1982.

Low-Priced USBR Water

Although the USBR supplies water to only about a fifth of all irrigated land in the West, its prices are among the lowest in the region. Thus, USBR water is now applied mainly by flooding, with little consideration for efficiency.

The USBR currently charges each farmer a different price, but the differences are not based on the water's cost. Rather, they reflect individual farmers' land class, farm size, and ability to pay. Moving to a cost-based pricing system would raise farmers' USBR water prices.

Regardless of the mechanism ultimately adopted, higher federal water prices would undoubtedly spur greater conservation activity.

However, a large-scale move to conserve irrigation water in the West could produce unintended side effects. Besides causing farmers to shift to more efficient irrigation technologies, farmers would change from low-value, water-intensive crops, such as alfalfa hay, forage, and pasture grasses to higher valued food crops and feed grains, which require much less water to sustain high yields.

While such a scenario might impact on the prices of the commodities involved, Ayer contends that any price or supply impact on feed grains and roughages would be minimal.

In any case, the long run benefits of higher priced Western water are likely to outweigh the side effects. □

[*Based on material from ERS economists David Wilson and Harry Ayer of the Natural Resource Economics Division.*]

REPORTS IN THE NEWS

Feeding Japan's Meat Demand

Japan has long been the largest single-country market for U.S. agricultural exports, especially grains and oilseeds. Because animal feed accounts for 80 to 85 percent of Japanese coarse grain and oilseed consumption, future imports will depend upon what happens in Japan's livestock sector.

According to current estimates, the Japanese livestock industry will expand over this decade, but at a slower pace than in 1960-80. Since Japan is able to produce only about 2 percent of its current livestock feed needs, any expansion will depend heavily on imports, mainly from the United States.

The result: An increase in U.S. grain and soybean exports, possibly by as much as a third by 1990, according to USDA economist William T. Coyle of the Economic Research Service. Coyle points out that the future shape of Japan's feed-livestock economy will depend on a number of factors, including:

- The changing role of livestock products and fish in the Japanese diet.
- Government trade and farm policy and its effect on the growth and development of the livestock sector.
- The ability of Japan's fishery industry to adjust to limited access to foreign fishing grounds, and the public commitment to protect and promote development of domestic coastal resources.
- The availability of feedstuffs, both imported and domestically produced.

Each subject is discussed with particular attention to projections to 1985 and 1990.

Japan's Feed-Livestock Economy: Prospects for the 1980's *by William T. Coyle. (Published February 1983; 79 pages, text, tables, and charts; GPO Stock No. 001-000-04316-1; $5.00.)*

Managing China's Farm System

How does China manage the world's largest agricultural labor force?

China has a unique farm system. Communes are not just workplaces; they integrate all aspects of rural life for their residents, including education, transportation, health care, commerce, and military affairs. Central plans guide the economic behavior of communes.

USDA economists Francis Tuan and Frederick Crook examine the organization of China's agricultural system and the policymaking process for agriculture. Their focus is on the planning and statistical systems that support China's farm economy.

Government plans, targets, and administrative orders form the heart of the policymaking process. Leaders of production units—farms or factories—look to these plans, targets, and orders for guidance. This system contrasts sharply with the U.S. agricultural economy where farmers and business executives monitor markets, prices, and interest rates to guide their economic decisions.

Statistical reporting systems provide the critical flow of information which China's leaders use to formulate plans and allocate resources to agriculture and industry. The gathering of agricultural statistics—virtually abandoned during the Cultural Revolution of the mid-1960's to mid-1970's—has resumed, but it remains very weak.

Modern sampling techniques are rarely used, so the data collection process is tedious and time consuming. Problems are compounded by the shortage of trained statisticians and the lack of electronic data processing equipment that can handle a huge volume of data.

Planning and Statistical Systems in China's Agriculture *by Francis Tuan and Frederick Crook. (Published April 1983; 88 pages; GPO Stock No. 001-000-04329-3; $5.50.)*

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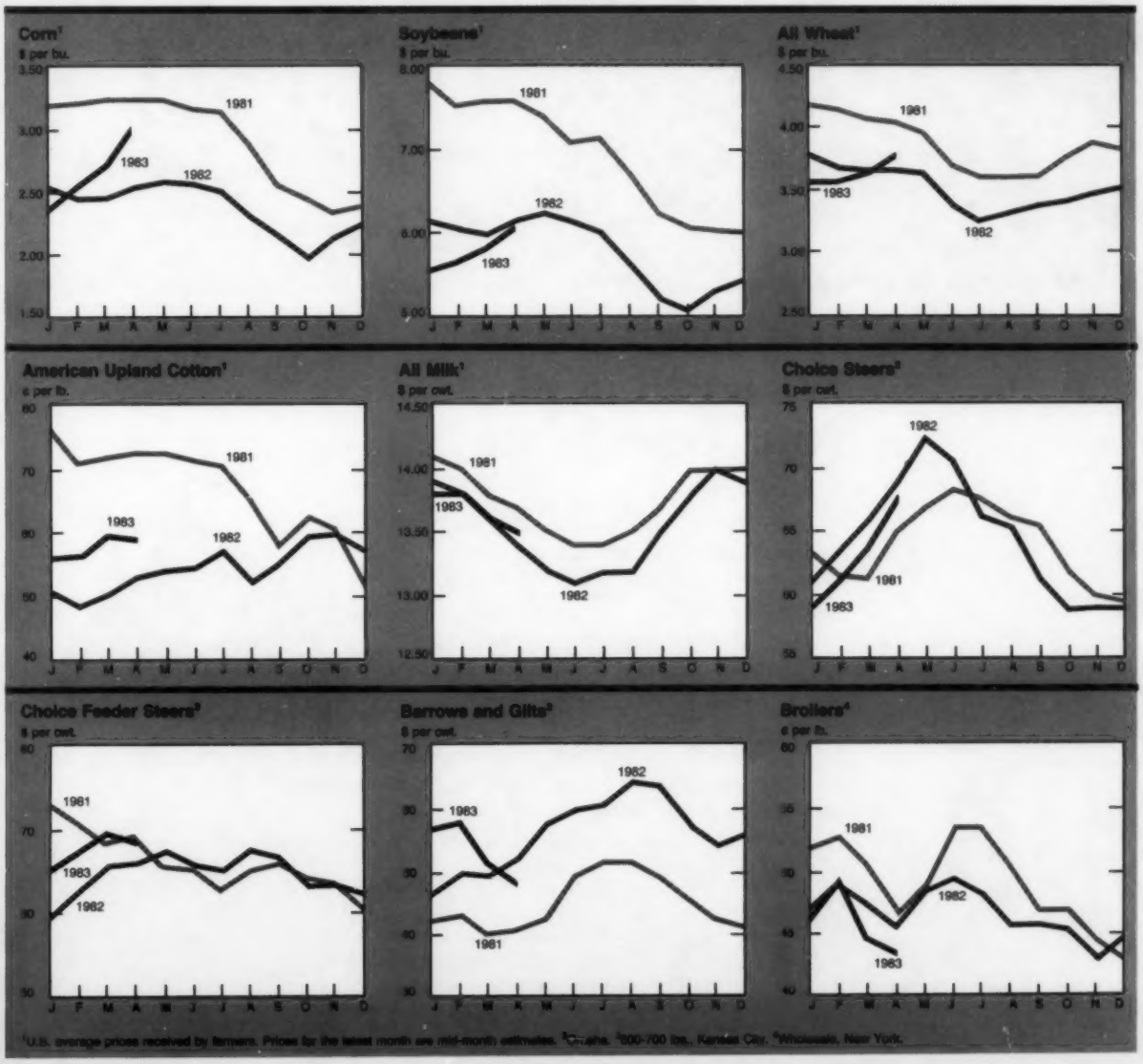
FARMLINE TRENDS

Monthly Price Monitor

Average farm prices for major field crops continued to strengthen in April. Corn climbed to $3 a bushel, the highest price since summer 1981, while soybeans topped $6 for the first time since last June. Wheat reached $3.78 a bushel, the highest since January 1982. In the livestock sector, Choice steers jumped nearly $4 per cwt from March. Feeder steer prices declined slightly but were still running ahead of year-earlier levels. Barrows and gilts dropped to near $48 per cwt, the lowest price in more than a year, and broiler prices slipped a penny per pound.



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